

In the Claims:

1. (Original) A process for making a linear alpha-olefin oligomer in a reactor comprising a liquid and a gas phase, comprising the steps of catalytically oligomerizing ethylene in the presence of a complex selected from the group consisting of nickel, palladium, cobalt, titanium, zirconium, hafnium, vanadium, chromium, molybdenum, and tungsten complexes, to an alpha-olefin oligomer under release of heat, and removing the heat with a heat exchanger, which is not in direct contact with the liquid phase, using at least part of the gas phase as a coolant medium.
2. (Original) The process of claim 1 wherein the complex is selected from the group consisting of nickel, titanium, zirconium, and chromium complexes.
3. (Original) The process of claim 1 wherein the alpha olefin oligomer has an average molecular weight between about 50 and about 350.
4. (Original) The process of claim 3 wherein the average molecular weight is between about 60 and about 280.
5. (Original) The process of claim 4 wherein the average molecular weight is between about 80 and about 210.
6. (Original) The process of claim 1 wherein the coolant medium is selected from the group consisting of an alkane, an inert heteroatom-containing group substituted alkane, an alkene, and an aromatic compound, and mixtures thereof.
7. (Original) The process of claim 1 wherein the coolant medium is selected from the group consisting of propane, n-pentane, isopentane, ethylene, 1-butene, o-, m-, and p-xylene, and toluene, and mixtures thereof.

Claims 8-16 (canceled).

17. (New) The process of claim 1 wherein the heat exchanger is positioned in the gas phase in the reactor.